

Application No. 09/594,816
Amendment filed June 3, 2004
Reply to final Office Action mailed April 4, 2004

Attorney Docket No. 040071-079
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Amendments to the Specification:

Please **ADD** the following paragraph beginning at page 4, line 11, of the specification:

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Beyond the patent literature, the published technical literature also provides useful description regarding the desirable attributes of exponential horns for sound propagation. In particular, a 1924 A.I.E.E. article authored by C. R. Hanna et al. is of interest for its teaching of the theoretical considerations pertaining to the design of acoustic horns for best sound propagation.

Please **REPLACE** the paragraph beginning at page 5, line 13, with the following paragraphs:

B²
The driver 25 preferably includes a driving membrane 37. The driver 25 is preferably quite small, preferably on the order of 2 mm x 1 mm x 5 mm overall, although the driver may be larger or smaller as desired or necessary. The driving membrane 37 is also preferably quite small, preferably on the order of 1 mm or less in diameter, although larger or smaller driving membranes may be used as desired or necessary. For example, the driving membrane 37 may be on the order of 2 mm, 3 mm, 4 mm, 5 mm, etc., as desired or necessary. A preferred embodiment of the driving membrane 37 is circular but the driving membrane may be of any suitable shape, such as square, triangular, oval, etc., as desired or necessary. ~~The horn 27 is preferably also quite small, and is preferably on the order of 5 mm tall, 1 mm thick, and 3-4 mm wide at its widest dimension. The horn 27 may be of many different sizes and shapes. For example, the horn 27 may have a cross sectional shape that is circular, oval, square, triangular, rectangular, or some combination of shapes, such as a polygon having flat side walls and curved top and bottom walls. The horn 27 may be substantially straight, such as is seen in FIG. 3, may be curved along its length, such as is seen in FIG. 2, or may have some other suitable shape along its length.~~

The horn 27 has a cross-sectional area that generally increases from the small end proximate the driver 25 to the large end 29 proximate the exterior surface 31 of the body 23. The manner in which the sound pressure in the horn 27

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varies can depend on the rate of growth of its cross-sectional area. This cross-sectional growth can be determined by the law under which the horn 27 expands. As an exponential device, the horn 27 can serve as an efficient impedance matching means between the source of the incident acoustic energy at the driver 25 and an ear positioned proximate the large end 29. Other acoustic horn types are contemplated for use in implementing the present invention. These can include horns of the conical type, parabolic type, hyperbolic type, plus other shapes and types.

The horn 27 is preferably also quite small, and is preferably on the order of 5 mm tall, 1 mm thick, and 3-4 mm wide at its widest dimension. The horn 27 may be of many different sizes and shapes. For example, the horn 27 may have a cross-sectional shape that is circular, oval, square, triangular, rectangular, or some combination of shapes, such as a polygon having flat side walls and curved top and bottom walls. The horn 27 may be substantially straight, such as is seen in FIG. 3, may be curved along its length, such as is seen in FIG. 2, or may have some other suitable shape along its length.
